

What is claimed is:

1. A die for extruding flowable material therethrough in a longitudinal direction, said die having a die inlet for admitting flowable material and a die outlet for expelling flowable material, said die inlet and die outlet being oppositely disposed on a longitudinal axis, said die outlet having a cross sectional area defining a die outlet plane having a major axis and a minor axis orthogonal thereto, said major axis being greater than or equal to minor axis, said die having a cavity connecting said die inlet and said die outlet, said cavity having a plurality of cross sections perpendicular to said longitudinal axis, said cavity having a static mixer therein filling said cavity at a cross section, said static mixer causing flowable material to flow in a direction having a component parallel to said major axis of said die outlet plane and in a direction having a component parallel to said minor axis of said die outlet plane as said flowable material is within said cavity.
2. A die for extruding flowable material therethrough in a longitudinal direction, said die having a die inlet for admitting flowable material and a die outlet for expelling flowable material, said die inlet and die outlet being oppositely disposed on a longitudinal axis, said die outlet having a cross sectional area defining a die outlet plane having a major axis and a minor axis orthogonal thereto, said major axis being greater than or equal to minor axis, said die having a cavity connecting said die inlet and said die outlet, said cavity having a plurality of cross sections perpendicular to said longitudinal axis, said cavity having a plurality of static mixers therein, at least one said static mixer filling said cavity at a cross section imparting bilateral flow to flowable material as said flowable material is within said cavity and passing through said static mixer.
3. A die according to claim 1 wherein said static mixer has a static mixer inlet defining a static mixer inlet plane and a static mixer outlet defining a static mixer outlet plane, said static mixer inlet plane and said static mixer outlet plane each being flat and mutually parallel.

4. A die according to claim 3 wherein said die outlet plane and said static mixer outlet plane are mutually parallel.
5. A die according to claim 4 wherein said static mixer outlet plane and said die outlet plane are coincident.
6. A die according to claim 1 having a cross direction orthogonal to said longitudinal direction, wherein said static mixer has a first surface area to void volume ratio coincident said longitudinal axis and a second surface area to void volume ratio at a position spaced from said longitudinal axis in the cross direction, said first ratio being different than said second ratio.
7. A die according to claim 1 further comprising a plurality of auxiliary inlets for admitting material or admitting energy to said cavity of said die.
8. A die according to claim 2 further comprising a plurality of auxiliary inlets for admitting material or admitting energy to said cavity of said die.
9. A die according to claim 2 wherein said first static mixer has a first length and said second static mixer has a second length, said first length and said second length being taken in said longitudinal direction, said first length being greater than said second length.
10. A die according to claim 9 having a first static mixer with a first surface area to void volume ratio and a second static mixer with a second surface area to void volume ratio said first ratio being greater than said second ratio.
11. A die according to claim 2 further comprising a plurality of auxiliary inlets for admitting material, energy or both to said cavity of said die, said auxiliary inlets being intermediate said first static mixer and said second static mixer.
12. A die according to claim 11 further comprising a plurality of inlet tubes, said inlet tubes penetrating said die cavity for admitting material or energy to said die cavity.

13. A die according to claim 12 wherein a plurality of inlet tubes are disposed in at least one said static mixer.
14. A die according to claim 2 wherein at least one said static mixer comprises a plurality of hollow bars, said bars admitting material or energy to said cavity of said die.
15. A die according to claim 2 wherein one said static mixer is substantially parallel to said longitudinal direction.
16. A die according to claim 15 having a longitudinal centerline, and comprising at least a first static mixer disposed on a first side of said longitudinal centerline and at least a second static mixer disposed on a second side of said longitudinal centerline, said first static mixer and said second static mixer not intercepting said longitudinal centerline.
17. A die according to claim 15 wherein said static mixer substantially parallel to said longitudinal direction intercepts a static mixer substantially perpendicular to said longitudinal direction.
18. A die according to claim 17 having a cross direction perpendicular to said longitudinal direction and a width taken in said cross direction, wherein said static mixer substantially perpendicular to said longitudinal direction extends the width of said die at a position coincident said static mixer.
19. A die for extruding flowable material therethrough in a longitudinal direction, said die having a die inlet for admitting flowable material and a die outlet for expelling flowable material, said die inlet and die outlet being oppositely disposed on a longitudinal axis, said die outlet having a cross sectional area defining a die outlet plane having a major axis and a minor axis orthogonal thereto, said major axis being greater than or equal to minor axis, said die having a cavity connecting said die inlet and said die outlet, said cavity having a static mixer therein, said static mixer having a plurality of bars for directing the flow of material in said die cavity, at least one said bar for admitting material, energy or both to said cavity of said die.

20. A die according to claim 19 wherein said bar admits energy to said cavity of said die, said bar having a window substantially transparent to the transmission of energy therethrough.